

# **EXHIBIT Q**



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## XaCCT 3.0: Distributed Accounting and Mediation Solution for TCP/IP Networks

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### Overview

XaCCT 3.0 provides Network Service Providers (NSPs) with a comprehensive, real-time service metering and mediation solution to enable accurate usage-based accounting/cost models for TCP/IP networks.

- Empowers Internet Service Providers (ISPs) to "right-price" their services.
- Enterprise IT managers can use this insight for network utilization audits to develop cost/charge-back models.

XaCCT 3.0 is a highly distributed system capable of running on multiple platforms. The software not only captures relevant transaction details from a multitude of nodes/information sources on the network, in real-time, it also performs policy-based merge and aggregation and produces billing records, SDRs (Service Detail Records), much like the CDRs (Call Detail Records) in the telephone switch. The SDRs are stored in the Central Database. These SDRs can then be used to generate various network utilization reports, in an enterprise or can be fed into the NSP's Customer Care & Billing (CCB) system. Since the format is compatible with most off-the shelf databases, such as Oracle™, Sybase™, Microsoft SQL™, it greatly reduces the cost of integration with existing CCB system, and time-to-market.

In Enterprise/Intranet environment the XaCCT solution enables IT managers to accurately audit network resource utilization, based on a multitude of parameters such as individual users, user-groups, specific subnets, volume of data transferred, application or service type as well as time-of-day, duration, source, destination, direction, etc. Through a simple browser interface multiple users can access the system, from anywhere on the network, configure and generate customized reports, concurrently. Reports may be viewed on the browser, sent via e-mail or saved into files and presented either as HTML or text files (comma-separated-values). The scheduler function enables users to create scheduled reports and get them automatically at regular intervals.

### System Architecture

The XaCCT system is a comprehensive accounting and mediation solution for TCP/IP networks. The system provides a unique view of network-wide activity, based on Network Sessions, in a totally non-intrusive manner.

The XaCCT system includes two functional components

- (i) Distributed, multi-source, multi-layer, highly scalable data collection and database repository system
- (ii) Reporting tool that processes and presents the network sessions data into customizable output.

The intuitive Web-based interface provides local and remote access to the system through a Java-

# DTX 012

enabled Web browser, such as Internet Explorer or Netscape Navigator/Communicator with Java™ support.

Add screen shots of Graphical reports - bar-charts, pie-chart, histograms,etc - Yuval  
He can use some traffic data to create (2) interesting graphical outputs using Excel

### **Multiple Information Sources**

The XaCCT system collects network activity data from multiple Information Sources on the Network and consolidates it into Network Sessions linked to real-world entities - users, departments, and the like. Since it is not always possible to obtain all the parameters for a given network session from one network element, different pieces of information must be obtained from many different Information Sources. For example, the source and destination address for an Internet session may be available from the FireWall-1 log, while the user name, department and the destination site information may have to be obtained from a DNS server.

### **Multiple Network Layers**

By using a multi-layer technology, the XaCCT system provides critical information on the application and type of service used during a session. Since the impact of different applications and services on the network varies, it enables the network operators to accurately assess the costs associated with services, based on network resource consumption. For example, e-mail vs. video.

### **Key Features**

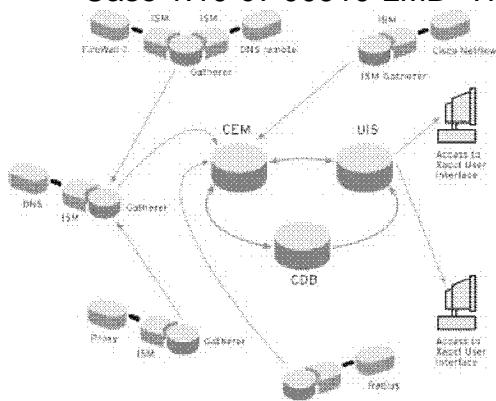
- ◆ Distributed multi-source and multi-layer data collection architecture.
- ◆ Totally non-intrusive to the network operation and infrastructure. Can be installed without disrupting any network activity or network element/node.
- ◆ Carrier-class scalable architecture allows for network expansion without costly reconfigurations.
- ◆ Real-time, policy-based aggregation, enhancement and merge of data, to create Unified Network Information Records (UNIR™), discarding redundant data.
- ◆ Local data caching for maximum efficiency.
- ◆ Centralized system configuration and administration including field upgrades.
- ◆ Web-based user interface for easy remote and local access to the system.
- ◆ Modular architecture allows maximum configuration flexibility, compatibility with multiple Information Sources, smooth integration, and easy upgrades.
- ◆ Open system architecture enables custom system configuration to meet the needs of a variety of network architectures.
- ◆ Support for standard databases
  - Oracle Server 7.3, Microsoft SQL Server 6.5, Sybase SQL Anywhere 5.0.
  - Option to buy XaCCT 3.0 with one of the above database systems bundled.
- ◆ Easy integration with any RDBMS-based Customer Care and Billing solutions allows reduced cost and shortened time-to-market.
- ◆ Easy integration with a variety of off-the-shelf Graphical Reporting packages.
- ◆ Available on Sparc/Solaris, Microsoft Windows 95 and Microsoft Windows NT.
- ◆ Secure communication between the system components for higher network security.
- ◆ Multiple levels of restricted access to the system for enhanced system and data integrity.

Wide range of Information Source Modules (ISM™) for capturing accounting data from virtually any Network Element/node, such as Authentication servers (RADIUS, TACACS+), Routers and Switches (Cisco NetFlow, Cisco IOS, RMON, SNMP), Mail servers, Proxy servers, DNS, Firewalls, Internet Telephony Gateways and many others.

### **System Components**

XaCCT 3.0 includes the following system components:

1. The Central Event Manager (CEM)
2. The Central Database (CDB)
3. The User Interface Server (UIS)
4. The Gatherers
5. Information Source Modules (ISM)



## *The XaCCT System*

## Central Event Manager

The Central Event Manager coordinates, manages, and controls the operation of the XaCCT system and its related components. The Central Event Manager has the following main functions:

- Coordinate, control, and manage the data collection process.
- Merges data collected by multiple Gatherers to eliminate redundancies.
- Perform clean-up and aging procedures on the database.
- Provide centralized system-wide upgrade, licensing, and data security.

The Central Event Manager stores its state, configuration and all the data directly in the database, thereby leveraging the robustness and fault-tolerance inherent to the database systems. CEM can recover from any system crash and coordinates the recovery of the XaCCT system to its previous state. However, the Gatherers continue to function, during the CEM recovery process.

CEM can be accessed via a Web browser, remotely or locally, through the XaCCT User Interface Server (UIS). This allows the network manager to centrally manage the entire XaCCT system from anywhere on the network.

## Central Database

The Central Database is the central repository of the information collected by the XaCCT system. The Central Database stores and maintains the data collected by the Gatherers, as well as the information on the configuration of the XaCCT system.

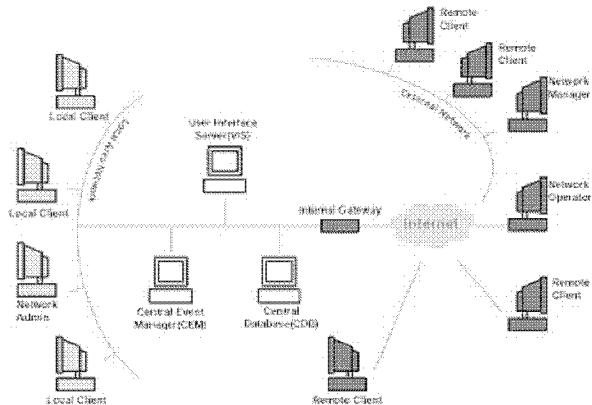
The information on network sessions is stored in the database in the form of a table. Each field in the table represents a network session parameter. Each record represents a network session. The structure of the Central Database can be modified: fields can be added, deleted, edited or indexed. Indexing generally improves the system response time. Data in the Central Database is accessed by running queries and reports. The old data is removed from the Central Database to free up space for new data, periodically.

Database Structure: XacCT utilizes an abstract database connectivity layer that enables it to store data in any ODBC compliant DB. The CDB runs on several commercially available relational database management systems (RDBMS) such as:

- Oracle 7.3 Server on any platform
- Microsoft SQL Server 6.5 on Microsoft Windows NT platform
- Sybase SQL Anywhere 5.0

### User Interface Server

The User Interface Server provides remote and local, platform independent access and control of the XaCCT system. The User Interface Server performs these functions through the XaCCT User Interface and the Status windows of the individual system components. Multiple clients can access the XaCCT User Interface through Java-enabled Web browsers, such as Internet Explorer or Netscape Navigator. Access to the XaCCT system is password protected, allowing only authorized personnel to log in to the system to maintain security.



***The User Interface Server provides local and remote access to the XaCCT system***

### Gatherers

The Gatherers are multi-threaded lightweight smart-agents designed to run on non-dedicated hosts as background processes (with minimal strain on CPU memory, disk space, or network resources). They collect network session data from a variety of Information Sources. The Gatherers are strategically located close to the Information Sources to minimize traffic on the network.

The Gatherers send the network session data either to other Gatherers to be enhanced or to the Central Event Manager to be stored in the Central Database. Each Gatherer can collect information from multiple Information Sources, allowing scaleable configuration of the collection system. The Gatherers are designed to be completely independent of the Information Sources from which they collect network session data. They use special interfaces, called ISMs, to access the Information Sources. This allows the Gatherers to connect to a wide array of existing and future Information Sources. The Gatherers load and run the Information Source Modules without interfering with the operation of the Information Source and its capabilities or the other Gatherers.

The Gatherers utilize a local cache, to locally store information obtained from the Information Sources. The size of the cache can be remotely changed, as needed. This feature helps minimize network congestion and enhances system performance.

The Gatherers can handle critical situations such as loss of connection and restarts by storing data in an output buffer until the system is back to its normal state.

The Gatherers are remotely administered and controlled by the Central Event Manager, allowing for low cost central administration and automated field upgrades to the entire XaCCT system.

### Information Sources

The XaCCT system can collect network session data from a NetFlow-enabled Cisco router, the log file of a mail server, the logging facility of a firewall, a traffic statistics table available on a switch and accessible through SNMP, a database entry accessible through the Web, an authentication server's query interface, and other network devices. By consolidating the information from all these sources, the XaCCT system can link real-world entities, such as the names of users and departments, to network activity.

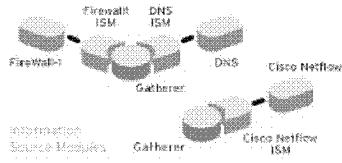
Each type of Information Source is accessed using a different method or protocol. A Gatherer accesses the Information Source using Information Source Module (ISM) for that particular Information Source. Additional Information Sources can easily be added to XaCCT 3.0.

XaCCT system is designed to capture and process data from both, asynchronous or "trigger" sources and synchronous or "enhancer" sources. A router generates session triggers whereas the DNS server helps enhance the session record.

### Information Source Modules

The Information Source Module acts as an interface between the Gatherer and the Information Source, enabling the Gatherer to collect data from different Information Sources. In a sense, the Information Source Module acts as a translator facilitating communication between the Information Source and the Gatherer.

Information Source Modules are add-ons to the XaCCT system. They can be removed or added to the system without affecting its basic configuration. Information Source Module installation and licensing is centrally administered by the Central Event Manager, enabling easy installation and field-upgrades.



#### Information Source Modules

#### Key System Functions

The XaCCT system performs the following key functions:

- Data Collection
- Data Aggregation
- Data Enhancement
- Data Merge
- Data Retrieval

#### Data Collection

The XaCCT system is capable of collecting data on every network session. The data is collected by the Gatherers from the various Information Sources, augmented by additional data from other Information Sources through Enhancement Procedures, and sent to the Central Database for storage.

The XaCCT system utilizes a proprietary data format called Unified Network Information Record (UNIR).

A UNIR includes a set of ideal parameters of a session, which may or may not be provided by the Information Source. The Information Source Modules transform the data they get from the Information Sources into UNIR format.

The Central Event Manager initiates the data collecting process on startup, signaling the Gatherers to begin collecting data on network sessions. Data collection ceases when the CEM is not operational. If and when the CEM is shutdown it commands the Gatherers to stop sending network information.

The data is sent to the CEM to be stored in the Central Database.

#### Data Aggregation

The ability to implement flexible and effective aggregation schemes inside the data collection units (Gatherers) is one of the key attributes of the architecture. Real-time, policy-based aggregation at the gatherer level enables the system to collect only the minimal information required to meet customers' accounting/reporting needs for specific time slots. It also minimizes the adverse impact on network performance, caused by the accounting action. The system allows the users ultimate flexibility by tailoring the building block of the SDRs to meet their specific needs. For example, a customer usually collecting total daily Web usage metrics only might want to further analyze Web usage on a specific sub-net and thus implement temporarily a different aggregation schemes that will report site views or even URL views.

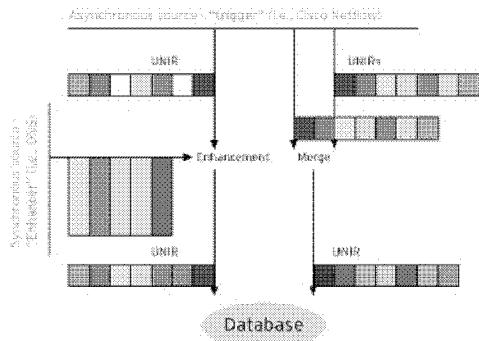
#### Data Enhancement

Before being stored in the database, the data is enriched through Enhancement Procedures. Typically the information a Gatherer receives from one Information Source is not sufficient to supply all the session details to create meaningful session record. Through the Enhancement Procedures information from multiple sources on the network is combined to obtain all required session parameters.

For example, the session data collected by Gatherer 1 from Information Source A contains the source IP address of a given session (like 200.201.32.1), but not the domain address of the source host, or Fully Qualified Domain Name, (such as pc17.xacct.com). The name of the source host can be obtained from another Gatherer (Gatherer 2) collecting information from another Information Source B - a Domain Name System (DNS). The DNS servers maintain information that matches the IP address of a computer to its corresponding Fully Qualified Domain Name (FQDN). As a result, the FQDN of the source host is added to the session record (its UNIR) and used to fill the corresponding field in the Central Database. The Enhancement Procedure can include enhancements for multiple fields. For example, the destination IP can also be used to obtain the FQDN of the destination host. The result will be used to fill yet another field in the UNIR. When all required fields are filled, the fully enhanced UNIR is sent to the CEM and then stored in the Central Database.

#### Data Merge

The CEM receives all enhanced UNIRs from all Gatherers. If a session is logged by several Gatherers, several UNIRs for the same session will be generated. To eliminate redundancy in the database, the CEM can be configured to merge duplicate records of the same network session before storing them in the CDB. A merge can be defined based on the field values of UNIR fields. This results in the UNIRs being further enhanced.



## Data Retrieval

The data collected by the XaCCT system is stored as database records, compatible with the leading relational database systems (RDMS) on the market. These records can be used by the Customer Care & Billing (CCB) system of the NSP, to generate usage-based bills for their customers. The data can also be retrieved in the form of customizable reports. For example, reports showing the top ten users of network resources in an organization, consumption of network resources by departments or cost centers, listing of all URLs visited, and many others. The reports can be generated in response to specific queries, or a set of pre-defined templates, at pre-defined frequency. The report can be generated in HTML, text format, sent via email and can be viewed through Web browser. Multiple users can produce and view reports at the same time.

## System Specifications

### Platforms

XaCCT 3.0 is available on the following platforms:

- Solaris 2.51 running on Sun Sparc platforms.
- Microsoft Windows 95 running on Intel Pentium platform
- Microsoft Windows NT 4.0 running on Intel Pentium platform.

### Relational Database Management Systems

XaCCT 3.0 can be used with any of the following Database Management Systems:

- Oracle 7.3 Server on Intel and Sparc platforms.
- Microsoft SQL Server 6.5 on Intel platform.
- Sybase SQL Anywhere 5.0

### Browsers

The XaCCT User Interface is accessible from Win32 platforms (Microsoft Windows 95 and Microsoft Windows NT) through the following browsers:

- Netscape Navigator 3.01 or later with Java plug-in.
- Microsoft Internet Explorer 3.02 or later with Java plug-in.

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